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THE IMPACT OF ROMAN ARMY ON TRADE AND PRODUCTION IN LOWER MOESIA (MOESIA INFERIOR)

Abstract

The paper presents the Roman army as the factor of change and economic transformation in the province of Lower Moesia. It addresses such issues as construction activities of the Roman army, development of the logistical base in order to meet the provisioning needs of the Roman troops. The main issue is the process of development of the local market of trade and production, as well as role of the Roman army in establishing and developing the fundamental branches of economy.

Key words

Lower Moesia, Roman army, economy, demography, monetization, construction, agriculture, manufacturing of ceramics, viniculture

The aim of this paper is to demonstrate the Roman army in Lower Moesia as the principal driving force of the local production¹. The attention will focus only on selected issues, such as demography, monetization, construction, agriculture, manufacturing of ceramics, viniculture.

DEMOGRAPHY

One of the decisive factors of the army's economic power was its numbers. A critical review of the available sources and the extensive literature of the subject permits one to determine that in 92-158 an average of 19 600 to 21 700 soldiers were stationed in the province (Tab. 1). From the late 2nd century to the mid-3rd century, excluding the periods of intense military activities, the strength of the Lower Moesian garrison fluctuated between 16 400 and 18 500 soldiers (without *classiarii*)². The numbers provided here include minimum and maximum values. This is dictated by two factors: the first is the fact that units of the Roman army never reached full complement in peacetime³, the second factor is the operational deployment of Lower

¹ The project was financed by the National Science Center in Kraków granted based on the decision number DEC-2011/03/N/HS3/00873. This text is based on doctoral dissertation defended in May 2013 at the Kazimierz Wielki University in Bydgoszcz. The dissertation is now pending publication.

² The number of troops were calculated based primarily on military diplomas: RMD I 50; RMD III 165; RMD IV 119, 222, 235, 241, 270; RMD V 337-338, 364, 399, 414; CIL XVI 44-45, 50, 78; 83; ILS 2189; CIL III 12452 = Kalinka 373; CIL III 6154; CIL III 6152 = 7478; CIL III 7473; CIL III 14429, 14430, 14211 (9) = Kalinka 62; AE 1957, 340 CIL III 7450; AE 1975, 750 and 1743 = AE 1979, 548, 550; ISM V 94-95; 102,117; W. Eck, A. Pangerl, Zwei Konstitutionen für die Truppen Niedermösians vom 9. September 97, ZPE 151, 2005, pp. 185-192; idem, Moesia und seine Truppen II. Neue Diplome für Moesia, Moesia Inferior und Moesia Superior, Chiron 39, 2009, pp. 510-512; D. MacDonald, A. Mihaylovich, A New Moesia Inferior Diploma of 97, ZPE 138, 2002, pp. 225-228; E.I. Paunov, M.M. Roxan, The Earliest Extant Diploma of Thrace, A.D. 114 (= RMD I 14), ZPE 119, 1997, p. 275; P. Weiß, Weitere Diplom fragmente von Moesia Inferior, ZPE 124, 1999, pp. 289-290; idem, Militär diploma für Moesia (Moesia, Moesia Superior, Moesia Interior), Chiron 38, 2008, pp. 296-300; M.M. Roxan, W. Eck, A Diploma of Moesia Inferior: 125 Jun. 1, ZPE 116, 1997, pp. 193-203; M.M. Roxan, An Auxiliary Fleet Diploma of Moesia Inferior: 127 August 20, ZPE 118, 1997, p. 288; W. Eck, A. Pangerl, Ein Diplom für einen Soldaten der classis Moesica vom 20. August 127 n. Chr., ZPE 165, 2008, p. 236; S. Torbatov, Rimska voenna diploma ot 145 g. ot Nigrinianis, Dolna Miziya, Arheologiya 4, 1, 1991, pp. 23-27; F. Matei-Popescu, The Roman Army in Moesia Inferior, Bucharest 2010.

³ In order to obtain such a proposal I confronted narrative sources with archaeological and epigraphical, more importantly, see: Publius Flavius Vegetius Renatus, *Epitoma Rei Militaris*; *Scriptores Historiae Augustae*, Alex. Sev. 50.5; Pseudo Hyginus, *De Munitionibus Castrorum*; Maurus Servius Honoratus, *In Vergilii Aeneidos Commentarius* VII. 274.1-2; Isidorus Hispalensis, *Etymologiae* XIX.33.2; Flavius Arrianus, *Ars Tactica* 18.2.; CIL III 6178; CIL III 14507; CIL III 6581; CIL III 6627; CIL III 14147; RMR 63-64; ChLA XI 501; A.K. Bowman, J.D. Thomas, *Vindo-*

Moesian troops outside the province (from 2,3% to 6,9% of the Lower Moesian forces were stationed in the Crimea)⁴.

Tab. 1. Garrison in Lower Moesia based on the diplomas of auxiliary forces with addition of legions

Year	Nominal-model strength	Number after subtraction of 10%	Presumed strength incorporating ca (-10%)	Nominal strength of auxiliary cavalry		classis
				alae	cohortes	
92	21 936	19 742	19 700-21 900	3584	1152	2000
97	25 136	22 622	22 600-25 100	4608	1408	2000
99	19 984	17 985	18 000-19 900	3072	1152	2000
107	20 536	18 482	19 500-20 500	1536	640	2000
111	20 536	18 482	19 500-20 500	1536	640	2000
116	18 872	16 984	17 000-18 800	1024	128	2000
119-120	22 296	20 066	20 000-22 200	2560	896	2000
121	21 624	19 461	19 500-21 600	1536	768	2000
125	18 936	17 042	17 000-18 900	1024	512	2000
127	23 256	20 930	20 900-23200	2560	896	2000
134	19 224	17 301	17 300-19 200	1024	624	2000
145-146	24 696	22 226	22 200-24 600	2560	1248	2000
154	24 152	21 736	21 700-24 100	2560	1008	2000
156/158	24 152	21 736	21 700-24 100	2560	1008	2000
Total: arithmetic average⁵	21 809	19 628	19 600-21 800⁶	2267 (2000)⁷	862 (780)⁸	2000

Source: author's calculations.

landa Writing-Tablets, London 1994, p. 90-98; N. Hodgson, P.T. Bidwell, Auxiliary Barracks in a New Light: Recent Discoveries on Hadrian's Wall, *Britannia* 35, 2004, pp. 121-157; R.S.O. Tomlin, Roman Manuscripts from Carlisle: The Ink-Written Tablets, *Britannia* 29, 1998, p. 42; D. Baatz, Kastell Hesselbach und andere Forschungen am Odenwaldlimes, *Limesforschungen* 12, Berlin 1973, p. 76-77. Selected bibliography: G. Cupcea, F. Marcu, Size and Organization of the Roman Army and the case of Dacia under Trajan, *Dacia* 50, 2006, pp. 175-194; J. Roth, The Size and Organization of the Roman Imperial Legion, *Historia* 43, 3, 1994, pp. 346-362; P. Southern, The Numeri of the Roman Imperial Army, *Britannia* 20, 1989, pp. 810-140; L. Cheesman, The Auxilia of the Roman Imperial, New York 1971; P. Holder, *Studies in the Auxilia of the Roman Army from Augustus to Trajan*, Oxford 2003; L.J.F. Keppie, *The Making of the Roman Army: from Republic to Empire*, Batsford 1984.

⁴ Calculated from: R. Saxer, *Untersuchungen zu den Vexillationen des römischen Kaiser Heeres von Augustus bis Diokletian*, Köln 1967, p. 91; T. Sarnowski, *Wojsko rzymskie w Mezji Dolnej i na północnym wybrzeżu Morza Czarnego*, Warszawa 1988, pp. 139, 149.

⁵ Arithmetic average is provided in round figures.

⁶ The result is also represented as a round figure. After addition the difference between the lowest and the highest number is 9,7% (9,67411...).

⁷ After subtraction of approx. 10%.

⁸ After subtraction of approx. 10%.

The role of the army in increasing demographic indicators is not limited to the fact that it was stationed in the province. Another significant factor was that its presence there was associated with the policy of population resettlement, from Barbaricum to the Roman side of the Danube. The policy aimed to settle the areas depopulated as a result of the events which had taken place on lower Danube area in the 1st century BC. According to Strabo's account, in the beginnings of the new era, Roman governor by the name of Aelius Catus resettled 50 000 Gets to Moesia⁹. Several decades later, during the reign of Nero, Tiberius Plautius Silvanus Aelianus, the then legate of Moesia, permitted over 100 000 people from beyond the Danube (*Transdanuviani*) to settle in his province¹⁰. Also, population numbers in the discussed region grew due to the resettlements of tribes from the territories south of the Stara Planina mountain range, such as the Bessi or the Lai¹¹.

Apart from resettlement the demography of the province was considerably influenced by¹²:

- veteran settlement (using R. Duncan-Jones's method it is possible to determine that annually no more than 110 veterans left a legion);
- civilian population following the troops to the location of their stationing, tempted by the opportunity of getting rich off trade and provision of services. As a result, they would settle in the vicinity of the legionary *canabae* and *vici* adjoining the forts of auxiliary forces¹³;
- non-military personnel, chiefly including slaves. J. Roth estimates that there might have been 1200 of those to one legion¹⁴. Analogically, in the period where the legionary contingent in Lower Moesia was 15 000 soldiers,

⁹ Strab. Geogr. 7, 3, 10; cf. L. Mrozewicz, Przesiedlenia ludnościowe na rzymską stronę Renu i Dunaju w okresie Wczesnego Cesarstwa (do wojen markomańskich), *Eos* 75, 1987, pp. 107-128; idem, Prosopographia Moesiaca II: Sex. Aelius Catus, *Eos* 86, 1999, pp. 103-105.

¹⁰ T. Zawadzki, Namiestnictwo Tyberiusza Plaucjusza Sylwanusa Elianusa w Mezji na tle polityki zbożowej cesarza Nerona, [in:] idem, Na peryferiach świata rzymskiego, Poznań 2009, pp. 50-69.

¹¹ Bessi in vicus Quintionis: ISM I 324, 326-328, 330-332. Lai in vicus Secundini: ISM I 343-347, 349.

¹² K.S. Verboven, Good for Business. The Roman Army and the Emergence of a 'Business Class' in the Northwestern Provinces of the Roman Empire (1st century BCE-3rd century CE), [in:] L. de Blois, E. Lo Cascio (eds.), *The Impact of the Roman Army (200 B.C.-.D. 476): Economic, Social, Political, Religious and Cultural Aspects*, Leiden-Boston 2007, pp. 304-305.

¹³ The issue was discussed by L. Mrozewicz, *Rozwój ustroju municypalnego a postępy romanizacji w Mezji Dolnej*, Poznań 1982.

¹⁴ J. Roth, *The Size and Organization*, p. 354, supports his calculations with the following argument: "They can be found by carefully noting Pseudo-Hyginus' terminology: he gives the number of «soldiers» (*militēs*) in a century as 80, but says that the cohort has 600 «men» (*homines*)", therefore, according to the author, the outstanding 120 persons have to be slaves (*colones*).

they were accompanied by 3600 slaves (*coloni*)¹⁵. Other researchers estimate the number of slaves in one legionary camp at 2000 people¹⁶.

Lower Moesia was severely depopulated due to the political events which preceded its creation. In this case, settlement of the deserted areas brought positive economic results. The growing numbers of inhabitants compelled the farmers to make their farming more efficient¹⁷ by sowing new species of plants and introducing changes in technology. A higher demographic factor also meant a greater number of consumers¹⁸, which fostered economic upturn, even in a pre-industrial economy based on agriculture which, according to universally recognised macro-estimates, employed 80-90% of the entire population of the Roman Empire¹⁹. The percentage was definitely higher in the case of Lower Moesia. Given the low degree of urbanization in the province (especially prior to Hadrian's reign) and lack of large production centres, large-scale mining was developed only in the western Lower Moesia (Montana)²⁰. Meanwhile, most Greek towns of the western coast of the Black Sea derived their chief profit from agriculture²¹.

The higher level of economic development becomes evident when the percentage of urban population uninvolved in farming increases²². Therefore the presence of Roman soldiers in Lower Moesia, a homogeneous group of consumers which, depending on the period, constituted 3-8% of the population, had a substantial impact on the economic development of Lower Moesia (Tab. 2).

¹⁵ Ibidem, p. 354.

¹⁶ L. Wierschowski, *Heer und Wirtschaft. Das römische Heer der Prinzipatszeit als Wirtschaftsfaktor*, Bonn 1984, p. 66.

¹⁷ E. Boserup, *The Conditions of Agricultural Growth: The Economics of Agrarian Change under Population Pressure*, New York 1965, pp. 63-64, 73: "concentration of population, accompanied by the change to intensive systems of cultivation, will take place only under the pressure of increasing populations" or "necessity is the mother of invention".

¹⁸ P. Erdkamp, *Urbanism*, [in:] W. Scheidel (ed.), *The Cambridge Companion to the Roman Economy*, Cambridge 2012, p. 256.

¹⁹ Ibidem, p. 246.

²⁰ N.B. Rankov, *A Contribution to the Military and Administrative History of Montana*, [in:] A.G. Poulter (ed.), *Ancient Bulgaria. Papers Presented to the International Symposium on the Ancient History and Archaeology of Bulgaria*, Nottingham 1983, pp. 40-73.

²¹ Al. Suceveanu, *Viața economică în Dobrogea romană (secolele I-III e.n.)*, București 1977.

²² Already A. Smith noted that division of labour is one of the reasons why nations gain wealth, see: *An Inquiry into the Nature and Causes of the Wealth of Nations* (Polish translation: *Badania nad naturą i przyczynami bogactwa narodów*, 1-2, Warszawa 1956); R. Saller, *Human Capital and Economic Growth*, [in:] W. Scheidel (ed.), *The Cambridge Companion*, p. 80.

Tab. 2. Estimated population of Lower Moesia and army's percentage share

Hypothetical period	Minimal population density per km ²	Total population	Estimated number of troops	Army's percentage share in population
1 st cent.	5 persons	ca 300 000	21 600-23 800	7-8%
2 nd cent.	9 persons	ca 550 000	21 600-23 800	4-4,5%
3 rd cent.	12 persons	ca 750 000	ca 20 000	3-3,5%

Source: author's calculations.

It would be a mistake to assess the scale of economic role of the Roman army with respect to the entire population. One should be guided by the specificity of pre-industrial economies, in particular the low degree of employment outside agriculture. In such an approach, the Roman army becomes a major economic force, which has a substantial impact on the economy of the occupied frontier territories (Tab. 3).

Tab. 3. Growth of employment in industries other than agriculture thanks to the presence of troops in the province

Total population	Estimated number of people employed outside agriculture (5% for the 1 st cent., 10% for the 2 nd -3 rd cent.)	Size of garrison	Non-agricultural employment growth in Lower Moesia
(1 st cent.) 300 000	15 000	21 600-23 800	130-140%
(2 nd cent.) 550 000	55 000	21 600-23 800	ca 40%
(3 rd cent.) 750 000	75 000	ca 20 000	ca 18%

Source: author's calculations.

In the 1st century, when the population of Lower Moesia was approximately 300 000 the coming of the troops caused a 130-140% increase in the number of persons employed outside agriculture. Such a high percentage is due to the situation in Lower Moesia: low population, no urban centres apart from a few cities on the Black Sea coast, lack of large centres of craft production. In the 2nd century, due to advancing urbanization and Roman colonisation, the army constituted around 40% of the population which was not involved in farming (18% in the 3rd century).

MONETIZATION

The high degree of militarization of Lower Moesia had an influence of the economic processes in the province, which included monetization as the soldiers received money in respect of pay, discretionary bonuses and veteran gratuities. Those were the elements which underlay the development of cash & commodity economy. The impact of the army on monetization is also borne out by the geographical and chronological distribution of coin hoards dated to the 1st century²³, with the earliest concentrated in western Moesia, which was the first to be occupied by legions and auxiliary units. The second such area was Dobrudja, whose Greek towns were soon within the range of economic power of Rome, shortly after establishment of autocratic rule of Augustus²⁴ (map 1). The penetration of Roman coins into the territory between Lower Moesia and Dobrudja²⁵ was a result of deploying Roman troops east of Novae during the reign of Vespasian²⁶. Civilians would follow the army to their new locations, to act as intermediaries in commercial exchange between the indigenous population and the soldiers, thus contributing to the broader circulation of coins. A greater number and wider geographical distribution of coin hoards dated to the 2nd century confirm that Roman currency was used throughout the province (map 2).

Hoard containing coins as well as minor finds of minted material testify to the role of Roman army in monetization of the rural regions, especially those which were important for economic reasons. One of such areas was the region of Montana, where mines of valuable ores were to be found. Such facilities were secured by numerous auxiliary units and veteran settlement²⁷. In the vicinity of military settlement there were villas whose inhabitants engaged

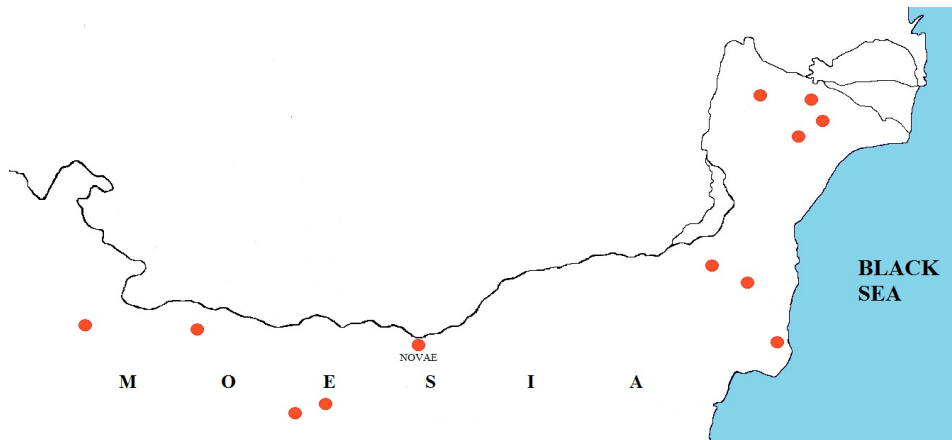
²³ On coin hoards see: B. Gerov, *Die Einfälle der Nordvolker in den Ostbalkanraum im Lichte der Münzenschatzfunde*, I, Das II. und III. Jahrhundert (101-284), ANRW 6, 1977, pp. 110-181; J. Fitz, *Der Geldumlauf der römischen Provinzen im Donaugebiet Mitte des 3. Jahrhunderts*, I, Budapest-Bonn 1978; A. Kunisz, *Obieg monetarny na obszarze Mezji i Tracji w I i II wieku n.e.*, Katowice 1992; C. Găzdac, *Monetary Circulation in Dacia and the Provinces from the Middle and Lower Danube from Trajan to Constantine I (AD 106-337)*, Cluj-Napoca 2002; E.I. Paunov, I.S. Prokopov, *An Inventory of Roman Republican Coin Hoards and Coins from Bulgaria*, Milano 2012.

²⁴ More broadly on Greek cities, see: M. Musielak, *Społeczeństwo greckich miast zachodnich wybrzeży Morza Czarnego*, Poznań 2003.

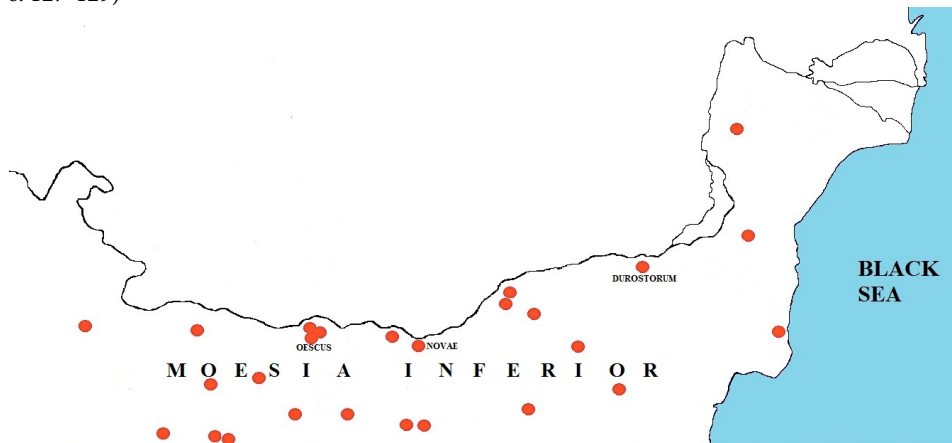
²⁵ A. Kunisz, *Obieg monetarny*, p. 129; E.I. Paunov, I.S. Prokopov, *An Inventory of Roman Republican Coin Hoards*, p. 55.

²⁶ T. Sarnowski, *Wojsko rzymskie*, pp. 39-52.

²⁷ V. Velkov, *Montana (The Present-Day Mihailovgrad)*, [in:] idem, *Roman Cities in Bulgaria. Collected Studies*, Amsterdam 1980, pp. 85-101; N.B. Rankov, *A Contribution*, pp. 40-73; B. Gerov, *Landownership in Roman Thracia and Moesia (1st-3rd century)*, Amsterdam 1988, p. 108.



Map. 1. Denarii coin hoards from I century (prepared based on: A. Kunisz, *Obieg monetarny*, s. 127-129)



Map. 2. Denarii coin hoards from II century (prepared based on: A. Kunisz, *Obieg monetarny*, s. 142-146; C. Găzdac, *Monetary in Dacia*, s. 153, tab. A.5)

in commercial contacts with the troops stationed nearby²⁸. The phenomenon is evidenced by the coins discovered within ancient villages, such as vicus Vorvorum, vicus Tautiomosiceus or vicus Novus. The same applies to the area of Popovo and Shumen, a region of decidedly agricultural character²⁹. Most money went to the urban and rural elite as well as veterans, who were

²⁸ On Villas see V.H. Baumann, *Ferma Romană din Dobrogea*, Tulcea 1983; V. Dinchev, *Rimskite villi v dneshnata bŭlgarska teritoriya*, Sofia 1997; L. Mulvin, *Late Roman Villas in the Danube-Balkan Region*, Oxford 2002.

²⁹ B. Gerov, *Landownership*, p. 121.

the owners of medium and large holdings³⁰. The army also had its part in the monetization of cities, e.g. Nicopolis ad Istrum, located ca. 50 km in a straight line from the legionary camp in Novae, which was founded after Trajan's Dacian wars³¹. Initially, the coins used in the city originated from the central mints and were put in circulation thanks to Roman army. As the urbanization progressed, this dependency decreased while the significance of civilian element in the economic life of the province grew. Local coinage in Nicopolis ad Istrum, Marcionopolis and growing issue from Greek centres in eastern Lower Moesia enabled those cities to achieve greater self-sufficiency, which lasted until the reign of Gordian III³².

Army was the largest beneficiary of the state's financial resources. The minimum amount that the Roman army stationed in Lower Moesia (excluding river fleet) in the 1st and in the early 2nd century was able to spend outside garrison from pay itself was approximately 3 000 000 denarii. After the abolishment of deductions from military pay the sum increased to 7 000 000 denarii. The amounts grew correspondingly with the increases in military wages³³: 11 800 000 under Septimius Severus, 17 700 000 under Caracalla, reaching eventually 35 500 000 denarii during the reign of Maximinus Thrax (Tab. 4). Those numbers should be approached with great caution as Rome sought to reduce to cost of maintaining the army. One of the employed

³⁰ L. Wierschowski, *Heer und Wirtschaft*, pp. 161-173.

³¹ Nicopolis ad Istrum has an extensive literature, see the list of references in: A.G. Poulter, *Nicopolis ad Istrum: A Roman, Late Roman and Early Byzantine City. Excavations 1985-1992*, London 1995; L. Slokoska, P. Vladkova, I. Tsurvov, R. Ivanov, *Nicopolis ad Istrum*, [in:] R. Ivanov (ed.), *Rimskii Rannovizantijski gradove v Balgariya. Studies in Memory of Prof. Teofil Ivanov*, 1, Sofiya 2002.

³² A. Bursche, *Emisje autonomiczne Mezji i Tracji oraz ich rozpowszechnienie w Europie Środkowo-Wschodniej, Balcanica Posnaniensis* 1, 1984, pp. 235-244; K. Butcher, *The Coins*, [in:] *Nicopolis ad Istrum: A Roman, Late Roman, and Early Byzantine City. Excavations 1985-1992* by Andrew Poulter, London 1995, pp. 269-314.

³³ On the amounts of military pay see Tac. *Ann.* I, 17; *Swet. Dom.* 7.3; *Herodian* III, 8, 5; *HA.*, *Sev.* I2; *Cass.*, *Dio*, LXXVIII; *Herodian* VI, 8, 8; *Veg.*, *Epit.*, II, 7; *ChLA* 446, 473, 495; *RMR* 68-72; *P. Panop.* 2; *ILS* 2487; A. von Domaszewski, *Der Truppen sold der Kaiserzeit, Neue Heidelberger Jahrbücher* X, 1900, pp. 225-241; P.A. Brunt, *Pay and Superannuation in the Roman Army*, *PBSR* 18, 1950, pp. 50-71; G.R. Watson, *The Pay of the Roman Army: Suetonius, Dio and the quantum stypendium*, *ZPE* 5, 6, 1956, pp. 332-40; B. Dobson, *Legionary Centurion or Equestrian Officer. A comparison of pay and prospects*, *AncSoc* 3, 1972, pp. 193-207; M.P. Speidel, *The Pay of the Auxilia*, *JRS* 63, 1973, pp. 141-147; R. Develin, *The Army Pay Rises under Severus and Caracalla, and the Question of annona militaris*, *Latomus* 30, 1971, pp. 687-695; J. Jahn, *Der Sold römischer Soldaten im 3. Jh. n. Chr.: Bemerkungen zu ChLA 446, 473 und 495*, *ZPE* 53, 1983, pp. 217-227; idem, *Zur Entwicklung römischer Sold zahlungen von Augustus bis auf Diocletian*, *SFMA* 2, Berlin 1984, pp. 53-74; M.A. Speidel, *Roman army pay scales*, *JRS* 82, 1992, pp. 87-106; R. Alston, *Roman Military Pay from Caesar to Diocletian*, *JRS* 84, 1994, pp. 113-123.

practices was shifting the expenditure on the local population, especially in the periods of intensified military activities, when the treasury failed to cover the army's demand for silver coin³⁴.

Tab. 4. Costs of maintaining army in Lower Moesia

Year	Composition of the army	Amount prior to deductions (in millions)	Amount after deductions (in millions)	Pre-deduction amount –10% ³⁵ (in millions)	Post-deduction amount –10% (in millions)
92	2 leg., 7 alae, 9 coh. eq., 6 coh. ped.	7 889 800	3 428 000	7 100 820	3 085 200
97	2 leg., 11 coh. eq., 8 coh. ped., 9 alae	8 968 900	3 868 610	8 072 010	3 481 749
99	2 leg., 9 coh. eq., 3 coh. ped., 6 alae	7 258 100	3 174 770	6 532 290	2 857 293
107	3 leg., 5 coh. eq., 2 coh. ped., 3 alae	7 678 100	3 646 575	6 910 290	3 281 917
111	3 leg., 5 coh. eq., 2 coh. ped., 3 alae	7 678 100	3 646 575	6 910 290	3 281 917
116	3 leg., 1 coh. eq., 1 coh. m. ped., 3 coh. ped., 2 alae	7 097 750	3 205 245	6 387 975	2 884 720
119-120	3 leg., 7 coh. eq., 1 coh. ped., 5 alae	7 898 050	3 736 785	7 108 245	3 363 106
121	3 leg., 6 coh. eq., 1 coh. ped., 3 alae	7 720 700	3 464 550	6 948 630	3 118 095
125	3 leg., 4 coh. eq., 1 coh. ped., 2 alae	7 138 550	3 226 845	6 424 695	2 904 160
127	3 leg., 7 coh. eq., 3 coh. ped., 5 alae,	8 622 450	3 837 435	7 760 205	3 453 691
134	3 leg., 2 coh. eq., 2 coh. ped., 1 coh. m. eq., 2 alae	6 956 050	3 257 445	6 260 445	2 931 700
145-146	3 leg., 6 coh. eq., 3 coh. ped., 2 coh. m. eq., 5 alae	9 059 000	4 001 160	8 153 100	3 601 044
154	3 leg., 6 coh. eq., 4 coh. ped., 2 coh. m. eq., 5 alae	9 193 750	4 051 485	8 274 375	3 646 336
156/158	3 leg., 6 coh. eq., 4 coh. ped., 1 coh. m. eq., 5 alae	8 886 800	3 935 760	7 998 120	3 542 184
Together, the arithmetic average		8 003 282	3 521 388	7 202 963	3 169 249

Source: author's calculations.

³⁴ R. Ciołek, P. Dyczek, Coins from Sector IV, [in:] P. Dyczek (ed.), Legionary Fortress and Late Antique 2, Warszawa 2011, pp. 250-253; A. Kunisz, Rola pieniądza proveniencji prowincjonalnej w systemie monetarnym Cesarstwa Rzymskiego, [in:] M. Jaczynowska, J. Wolski (eds.), Prowincje rzymskie i ich znaczenia w ramach Imperium, Wrocław 1976, pp. 87-103.

³⁵10% is a variable adopted following studies on the strength of the army in Lower Moesia.

CONSTRUCTIONS

The appearance of the military in Lower Moesia resulted in range of economic innovations occasioned by the necessity to develop infrastructure that the army required. The first Roman undertaking was development of a network of fortifications³⁶, including legionary camps, forts (*castellae*), watchtowers and guard posts. The line of fortifications in Lower Moesia, comprising around 46 installations³⁷, was approximately 670 km long. Further 68 installations and facilities³⁸ extended into the province, at a distance of 30-70 km³⁹ from the limes (map 3). Besides fortifications, the army traced out new roads and built bridges on the routes leading to the camps, connecting cities at the same time⁴⁰. Harbours were found in the vicinity of fortifications located on the Danube. Engineering detachments build aqueducts and underground water supply network.

Although the roads were built to be able to redeploy troops in a short time, the network was used by the administration, traders, and inhabitants of the province. Moreover, road infrastructure enabled Rome to profit from commerce by imposing *portorium* on the merchants who passed through customs stations. The roads built by the army had an impact on economic activity associated directly with any communication routes, such as the roadside taverns or inns⁴¹. Lower Moesian *villae rusticae* were built not only near ports but also near major roads, which enabled their owners to sell their

³⁶ About Roman fortifications: N. Gudea, Der untermoesischen Donaulimes und die Verteidigung der moesischen Nord- und Westküste des Schwarzen Meeres. *Limes et litus moesia inferioris* (86-275 n. Chr.), *JRGZM* 52, 2005. Currently, the most up-to-date study is: M. Lemke, *Geografia wojskowa Mezji Dolnej. Czynniki naturalne, kulturowe i logistyczne w organizacji limesu prowincji Moesia Inferior w okresie pryncypatu* (I-III w.), Typescript of PhD's thesis defended in 2012, available from the University of Warsaw Library.

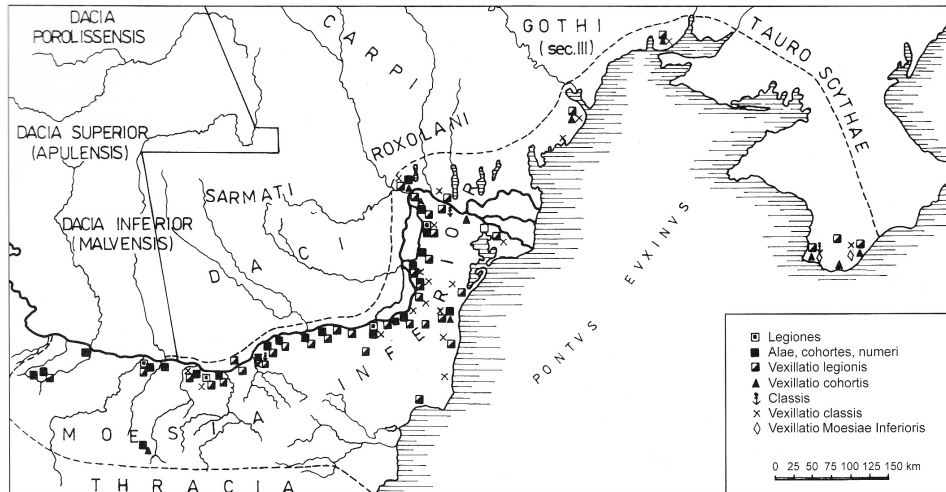
³⁷ M. Lemke, *Geografia wojskowa*, map at the end of typescript.

³⁸ M. Biernacka-Lubańska, *The Roman and Early-Byzantine Fortifications of Lower Moesia and Northern Thrace*, Wrocław 1982.

³⁹ The size of the province: A.G. Poulter, *Town and Country in Moesia Inferior*, [in:] idem (ed.), *Ancient Bulgaria*, p. 85.

⁴⁰ About roads in Lower Moesia see: K. Miller, *Itineraria romana: Römische reisewegean der hand der Tabula Peutingeriana*, Stuttgart 1916; idem, *Die Peutingersche Tafel*, Stuttgart 1962; S. Torbatov, *Pütna mrežha v trakiya i miziya* (I-III v.), [in:] R. Ivanov (ed.), *Arheologiya na balgarskite zemi*, 1, 1, Sofia 2004, pp. 76-95; idem, *The Roman Road Durostorum-Marcianopolis*, *AB* 4, 2000, pp. 59-72; A. Panaite, *Roman Roads in Moesia Inferior. Epigraphical Evidence*, *Novensia* 23, 2013, pp. 131-143; Th. Pekäry, *Untersuchungen zu den römischen Reichsstrassen*, Bonn 1968; H. Gajewska, *Z badań nad zagadnieniem dróg rzymskich łączących Dolną Mezję z Dacją* (Durostorum-Angustia), *KHKM* 1, 1970, pp. 27-35.

⁴¹ M. Madzharov, *Pütyat Eskus – Filipopol* (I-IV B.), *Arheologiya* 32, 1990, pp. 18-29.



Map. 3. The line of fortifications in Lower Moesia (after N. Gudea, *Der Untermoesische-Donaulimes*, p. 378, Abb. 27)

products directly to the travellers. One of the largest of such centres of ceramic production was in Butovo, near the road connecting Nicopolis ad Istrum and Novae. Much the same applied to imperial estate, which is attested to in the inscription from Kolarci, mentioning a soldier in the rank of *strator consularis*; the antique road station of Palmatis was found nearby⁴². The areas adjoining the roads was also a place where emporia were built. One of those, bearing the name of Emporium Piretensium was located near Butovo, on the route from Nicopolis ad Istrum to Melta⁴³.

The construction undertakings of the Roman army positively affected urbanization of the province, which in turn boosted the pace of economic development, as the local market grew along with the increasing numbers of producers and consumers.

The safety ensured by the army and the opportunity of gain from trade and services provided for the army promoted wealth of settlements situated in the vicinity of legionary fortresses. With time, the former developed their own internal market, and began to rely increasingly on mutual exchange, thus becoming less dependent on the troops stationed nearby. Urbanization

⁴² S. Torbatov, *Latinski posvetitelen ladpis ot Dolna Miziya*, *Arheologiya* 31, 1989, pp. 34-37.

⁴³ T. Zawadzki, *Emporium Piretensium*, [in:] idem, *Na peryferiach świata rzymskiego*, pp. 71-82. A different location is suggested by I. Tsarov, *The Location of Empeirum Piretensiu*, *AB* 1, 2005, pp. 47-52.

of the province was not associated exclusively with military strongholds. The roads built by the army attracted settlement, be it larger or smaller, just as the sites where natural resources were mined under army supervision.

AGRICULTURE

In the 1st century, the army occupying the then territory of Moesia (later the area of the western Lower Moesia), obtained their grain supplies from the northern regions of the Black Sea coast, from Bithynia and Pontus. The 2nd century marked a shift in that respect, as there had appeared farms which in all likelihood supplied grain to local garrisons. The largest holding was the imperial domain in Madara⁴⁴ as well as smaller villas, e.g. the three villas in Montana⁴⁵; the one marked with no. 1 specialised in agricultural production⁴⁶.

A major agricultural centre, whose output was capable of providing for the military needs, was located in today's district of Shumen. Stamped building ceramics from Madara demonstrates that apart from imperial estates the land was held by leaseholders and independent producers⁴⁷. The site is known for the largest concentration of farming tools discovered in northern Bulgaria⁴⁸. Numerous veteran villas have been discovered in Dobrudja⁴⁹, which vividly illustrates their economic potential. After *honestia missio*, veterans would often take up a business activity.

Furthermore, one should not forget that Roman army exploited the areas surrounding the strongholds (*territorium/prata legionis*)⁵⁰ and contributed to their economic development. This might have been the source of a considerable volume of goods, obtained by requisition, taxation or acquisition of

⁴⁴ B. Gerov, Landownership, pp. 74-77; V. Dinchev, Rimskite villi, p. 77; T. Sarnowski, Wojsko rzymskie, p. 65.

⁴⁵ V. Dinchev, Rimskite villi, p. 146.

⁴⁶ G. Alexandrov, Anticena vila no. 1, kray Mihaylovgrad, InMSB 8, 1983, pp. 39-79.

⁴⁷ D. Detchev, Tukhli s latinski pečati ot Madara, [w:] Madara. Razakopki i prouchvaniya, Sofiya 1936, Anticena vila no. 1, pp. 11-21; B. Gerov, Landownership, p. 123.

⁴⁸ I. Cholakov, Ancient Economy South of the Lower Danube Limes (The Territory of Present-Day North Bulgaria) Based on Finds of Tools from the Period of the 1st-the Beginning of the 7th C. AD, [in:] L.F. Vagalinski, N. Sharankov, S. Torbatov (eds.), The Lower Danube Roman Limes (1st-6th C. AD), Sofia 2012, p. 64, Fig. 1.

⁴⁹ P. Dyczek, Amfory rzymskie z obszaru dolnego Dunaju. Dystrybucja amfor i transportowanych w nich produktów w I-III w. po Chr., Warszawa 1999, p. 266.

⁵⁰ C.R. Whittaker, Roman Empire. A Social and Economic Study, London 1994, p. 101.

merchandise by means of trade⁵¹. Those areas also provided the army with land for cultivation⁵² or pastures.

VINICULTURE

In the 1st century, the wine available in Lower Moesia was mainly Greek or originated from the western provinces of the Empire, Italy in particular⁵³. In the 2nd century, the import of wine from the western provinces dropped perceptibly. Greek wines predominated among the imported spirits, especially wines from Rhodes, which proved extremely popular in Lower Moesia, being supplied to such localities as Aegyssus, Callatis, Dimum, Dinogetia, Histria, Kaliarka, Novae, Noviodunum, Odessos, Tomi, Troesmis or Tropeum Traiani⁵⁴.

In the 2nd and the 3rd century, local wines had a considerable share in the spirits supplied to the army. The significance of vine growing in Lower Moesia is reflected in a special law issued between 138-169, which protected the industry in the region⁵⁵. The army's contribution to the development of viticulture in Lower Moesia is confirmed by the distribution of vine grower's tools discovered by archaeologists, which are most often found across the Danubian Lowland near the military sites on the limes⁵⁶.

One of the pieces of evidence of wine trade with the legionary camp in Novae is the tomb stele erected between 70 and 120 to commemorate Iulius Iero, a *negotiator*⁵⁷. The barrels represented on his sarcophagus gave rise to

⁵¹ A. Mócsy, *Das Lustrum Primipili und die Annona Militaris*, *Germania* 44, 1966, pp. 312-326; C.C. Monfort, *The Roman Military Supply During the Principate Transportation and Staples*, [in:] P. Erdkamp (ed.), *The Roman Army and the Economy*, Amsterdam 2002, p. 72.

⁵² Scene CX on Trajan's column shows a legionary doing field work near a fortification, see R. Vulpe, *Trajan's Column*, București 2002, p. 184.

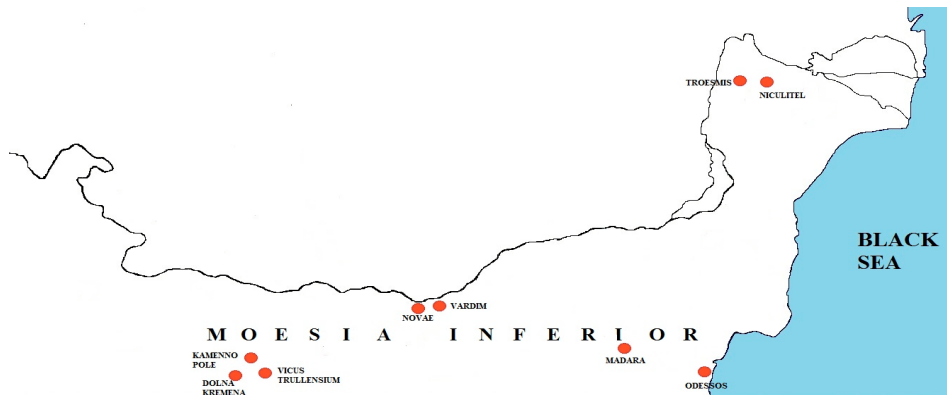
⁵³ P. Dyczek, *Amfory rzymskie*, pp. 260-261.

⁵⁴ P. Dyczek, *Wine in Lower Moesia*, *Historia Antiqua* 15, 2007, p. 243; A. Opaț, *Considerații preliminare asupra amforelor romane și Romano-Bizantine din Dobrogea*, *Peuce* 8, 1977-1978, p. 310.

⁵⁵ B. Gerov, *Kam za voprosa za lozarstvo v Dolna Miziya prez rimskoto vreme*, [in:] *Sbornik Gavril Kacarov*, Sofia 1955, pp. 187-193, the author analysed a fragment from *Dig. XLVIII, 19, 16*, and consequently concluded that the name Mysia mentioned in the text should not be identified with cultivation in Asia Minor but with Moesia, and that the excerpt is concerned with provinces on the lower Danube.

⁵⁶ I. Cholakov, *Ancient Economy*, p. 65.

⁵⁷ J. Kolendo, *Études sur les inscriptions de Novae*, *Archeologia* 16, 1965, pp. 132-138, *idem*, *Symboles des fonctions militaires et des métiers sur les monuments funéraires de Novae, camp de la legio I Italica (Moesia Inferior)*, *Novensia* 22, 2011, pp. 28-31.



Map. 4. Vilas in Lower Moesia which specialised in wine production (prepared based on: P. Dyczek, *Wine*, s. 237-350)

a widely accepted presumption that he was a wine merchant, storing and selling wine brought from the eastern part of the Empire or Greece to the legionaries. His eastern Roman name may indicate that this was so, although the possibility that he sold local wine cannot be ruled out⁵⁸.

The parents of Marcus Antonius Valens, for whom their son erected a tomb embellished with a bunch of grapes, a hoe and harvest sheaves, were either local producers or worked at a vineyard⁵⁹. The discovery of the tomb of Valens's parents near Novae proves that the wine they produced was intended for the soldiers of *legio I Italica*.

There were also villas in Lower Moesia which specialised in wine production (map 4). One of those was located in the aforementioned imperial estate in Madara⁶⁰. The others were found in Vardim, a few kilometres away from Novae⁶¹, Varna, Niculițel and Troesmis⁶². Tomb reliefs indicate that wine was also produced in Vicus Trullensium, Kamenno Pole and Dolna Kremena⁶³. Local wines would be transported in Dyczek 30 type amphorae, which are found in Butovo, Hotnica, Pavlikeni, Capaclia and Horia, as well as at the sites of military encampments in Novae and Troesmis⁶⁴.

⁵⁸ P. Dyczek, *Wine in Lower Moesia*, *Historia Antiqua* 15, 2007, p. 239.

⁵⁹ *ILatNovae* 53; J. Kolendo, *Inskrypcje wyzwolęńców i niewolników z Novae*, *Novensia* 6, 1993, p. 136.

⁶⁰ V. Dinchev, *Rimските villi*, p. 132.

⁶¹ *Ibidem*, p. 26; J. Reclaw, *Wykorzystanie ołowiu w Novae*, *Novensia* 16, 2005, p. 47, the author claims that the lead sheets discovered at the villa were elements of a wine-making press.

⁶² P. Dyczek, *Wine*, p. 241.

⁶³ S. Conrad, *Die Grabstelen aus Moesia Inferior*, Leipzig 2004, pp. 86-87.

⁶⁴ P. Dyczek, *Wine*, p. 243.

POTTERY PRODUCTION

The *terra sigillata* items which were supplied in the 1st century to the garrisons in Lower Moesia came from Asia Minor (Tralles), Italy (Arretium) and Gaul (Millau-La Graufesenque)⁶⁵. Once the Roman army had arrived, the local production of ceramics began to develop much faster, especially near the strongholds. Initially, apart from imported tableware, 1st-century artefacts included hand-made ceramics discovered in Oescus⁶⁶ and Novae⁶⁷. Those items attest that already at that time there was contact between the soldiers and the civilian population. Gradually, the quality of local ceramics improved under the influence of superior Roman imports⁶⁸, which is evident in Oescus, where the products manufactured in the 1st century by the local producers were good enough to be purchased by the soldiers of *legio V Macedonica*⁶⁹. Emulation of the Roman patterns and designs led to the development of local production, which reached its peak in the first decades of the 2nd century. At that time, *terra sigillata* ware began to be produced in Melta (Lovec), where a richly ornamented form was discovered; Montana represents a similar case⁷⁰. Also, a number of supra-regional pottery production centres have emerged, for instance the workshops located near Nicopolis ad Istrum in the vicinity of today's Butovo and Pavlikeni. In each of those locations there were several workshops⁷¹ which specialised in manufacturing particular types of ceramics. Pavlikeni craftsmen produced high-quality articles with red and grey-black coating⁷², chiefly bowls, vessels, cups, censers, lids, pots and pans as well as minor numbers of olive lamps⁷³. Butovo workshops turned out high-quality, richly ornamented tableware⁷⁴ as well as olive lamps, especially

⁶⁵ K. Domžalski, Terra Sigillata z komendantury w Novae. Wypełnisko jamy nr 4, Novensia 11, 1998, p. 128.

⁶⁶ G. Kabakchieva, Oescus: Castra Oescensia: rannorimski voenen lager pri ustieto na Iskür, Sofia 2000, p. 119.

⁶⁷ K. Domžalski, Ceramika stołowa z principia w Novae. Wypełnisko jamy nr 4, Novensia 11, 1998, pp. 148-149.

⁶⁸ A. Dimitrova-Milcheva, Produktion von Terra Sigillata in Untermoesien, RCRF 25-26, 1987, p. 515.

⁶⁹ G. Kabakchieva, Oescus, p. 119.

⁷⁰ A. Dimitrova-Milcheva, Produktion, p. 519.

⁷¹ B. Sultov, Ceramic Production on the Territory of Nicopolis ad Istrum (IInd-IVth Century), Terra Antiqua Balcanica 1, GSUFF 76/2, 1983 (1985), p. 11.

⁷² Ibidem, p. 25.

⁷³ P. Vladkova, Antichen proizvodstven tsentür pri Pavlikeni. Plan na kompleksa, periodizatsiya i vidove keramichni izdeliya, Veliko Tŭrnovo 2011, pp. 145, 147.

⁷⁴ B. Sultov, Proizvodstvo na reliefna keramika v Dolna Misiya, IIMVT 5, 1972, pp. 21-29.

in the early 3rd century⁷⁵. Those production centres were found not far away from the road connecting Novae, Nicopolis ad Istrum and Melta⁷⁶. Another site of mass ceramic production was Marcianopolis, which produced amphorae, kitchen- and tableware and, from the 3rd century onwards, an increased volume of olive lamps⁷⁷. It is no accident that pottery production centres were also to be found near the Novae camp (Peti Mogili)⁷⁸, Noviodunum⁷⁹ and Durostorum⁸⁰. One should not fail to mention the sites in the Dobrudja area, where major centres of production, i.e. Hogeia and Mamia⁸¹, were found near Telița. On top of that, a lamp production centre existed in Halmyris⁸².

Ceramic workshops in the vicinity of Durostorum supplied tableware and olive lamps to both legionaries of *legio XI Claudia* and inhabitants of the *canabae*⁸³. We know a number of names of workshops producing olive lamps in Lower Moesia: those found in Oescus produced by Atimeti, Favor, Ianuari, Luci; in Novae: Armeni, Atimeti, Ianuari, Sexti, Restutus, Retutu, Communis, Cresces, Festi, Lupati, Procili, Prude, Strobili, Flavi. In Durostorum: Armeni, Campili, Cassi, Lupati, Prude, Restuto, Sexti, Strobili, Flavi; in Troesmis: Strobili, Cassius, Armeni. However, one should note that local production in Lower Moesia did not replace imported ceramics until the late 2nd century. In the latter half of the 2nd century, products which enjoyed considerable popularity in Lower Moesia included ceramics from Reinzabern (Gaul) and Westerndorf (Germania)⁸⁴; this is evident in Noviodunum, where numerous fragments of such artefacts were discovered⁸⁵. In Novae and Durostorum,

⁷⁵ B. Sultova, Glineni lampki tip "Butovo", IIMVT 6, 1991, pp. 116-128, eadem, La production de lampes de terre cuite dans les centres céramiques près de Pavlikeni et à Boutovo, RCRF 29-30, 1991, pp. 295-305.

⁷⁶ B. Sultov, Ceramic Production, pp. 25, 29.

⁷⁷ A. Minchev, P. Georgiev, Marcianopolis. Ein Neues Zentrum der Keramikproduktion im 2-6 Jahrhundert, RCRF 29-30, 1991, pp. 223-244.

⁷⁸ P. Dyczek, Ceramic Production on the Lower Danube from the 2nd to the 4th Century AD, [in:] D. Bondoc (ed.), In Honorem Gheorghe Popilian, Craiova 2006, p. 177.

⁷⁹ V.H. Baumann, Ceramica terra sigillata de la Noviodunum, Peuce 6, 2008, p. 216.

⁸⁰ C. Mușețeanu, Imitations locales des sigillés décorés de Durostorum, Cercetări Arheologice 10, 1997, pp. 343-356; C. Mușețeanu, D. Elefterescy, Contribuții privind ceramic romană de la Durostorum (IV), Peuce 2, 15, 2004, pp. 95-127.

⁸¹ P. Dyczek, Ceramic Production, p. 177.

⁸² F. Topoleanu, Halmyris – un nouveau centre de production de lampes dans le nord de la Dobroudja (II^e-VII^e s. ap. J.-C.), RCRF 33, 1996, pp. 91-93.

⁸³ C. Mușețeanu, Un prototype de lampe de Durostorum, [in:] Corona Laurea. Studii în Onoarea Luciei Țeposu Marinescu, București 2005, pp. 343-347.

⁸⁴ A. Dimitrova-Milcheva, Terra Sigillata und dünnwandige Keramik aus Moesia Inferior (Nordbulgarien), Sofia 2000, p. 27.

⁸⁵ V.H. Baumann, Ceramica terra, p. 215.

archaeologists discovered lamps dating to the 2nd century, produced in northern Italy and bearing stamps of Fortis, Octavi, Strobili, Vetti, Decimi, Favor, Lucius⁸⁶. It should be emphasized that western Roman imports are encountered much more seldom in the Dobrudja area where, due to geographical location, goods were traded predominantly with the eastern provinces of the Empire. Lamps discovered in Noviodunum are a particular example of that exchange, where local types were in the majority (22 of 27 types). Northern Italian lamps did reach Noviodunum, as demonstrated by the presence of Fortis lamps, yet in much smaller numbers⁸⁷.

Legionaries also produced ceramic items on their own, as the discovery of *terra sigillata* mould in Novae suggests⁸⁸. Military production was widespread in the Dobrudja area, with a number of military workshops in Axiopolis, Sacidava and Troesmis, where legionaries of *legio V Macedonica* and *XI Claudia* produced the so-called LDKW (Lower Danube Kaolin Ware). The items were chiefly intended for use in the kitchens, and may be found in all military installations of the Lower Moesian limes. Interestingly enough, it was also used by civilians, although on a much smaller scale⁸⁹.

CONCLUSIONS

When the Roman army came to Lower Moesia, it inevitably triggered transformations throughout that territory. Population numbers, albeit initially small, grew rapidly, numerous villages have appeared; there was no shortage of urban centres, which gained considerable economic significance during the reign of the Severan dynasty. There were villas supplying produce or craft commodities. However, there is no doubt that every aspect of the

⁸⁶ C. Mușețeanu, V. Culică, D. Elefterescu, Lampes à estampille de Durostorum, *Dacia* 24, 1980, p. 283-305; R. Ivanov, *Vsekidnevniyat Zhivot*, [in:] R. Ivanov, G. Atanasov, P. Donevski (eds.), *Istoriya na Silistra. Antichniyat Durostorum 1*, Sofiya 2006, p. 130; M. Chichikova, *Pottery Lamps from Novae (Lower Moesia) (1st-3rd Century)*, [in:] T. Ivanov, M. Chichikova, A. Dimitrova-Milcheva (eds.), *Recherches sur la Culture en Mésie et en Thrace Bulgarie I^{er}-IV^e Siècle*, IAI 37, 1987, p. 165; A. Opaïț, *Considerații preliminare asupra ceramicii romane timpurii de la Troesmis*, *Peuce* 7, 1977-1978, p. 342. As regards FLAVI, a theory has been advanced recently that it was a producer from Upper Moesia, see: P. Regep-Vlascici, *Aspects of the Stamped-Lamp Trade From Upper Moesia*, [in:] *Corona Laurea*, pp. 459-461.

⁸⁷ V.H. Baumann, *Lucernele de la Noviodunum*, *Peuce* 7, 2009, pp. 217-310.

⁸⁸ A. Dimitrova, *Forma do produkcji terra sigillata znaleziona w Novae (Moesia Inferior)*, *Balkanica Posnaniensia* 3, Poznań 1984, p. 243.

⁸⁹ P. Dyczek, *Ceramika typu Lower Danube Kaolin Wares (LDKW). Dystrybucja, datowanie, funkcja, typologia, geneza, miejsca produkcji*, *Novensia* 20, 2009, pp. 154-171.

economic life of Lower Moesia was related in one way or another to the military. The province evolved economically in order to meet the provisioning needs of the army, which consequently led to the development of the civilian market.

Michał Duch

WPLYW ARMII RZYMSKIEJ NA HANDEL I PRODUKCJĘ W MEZJI DOLNEJ (MOESIA INFERIOR)

Streszczenie

Pojawienie się żołnierzy rzymskich na obszarze prowincji Mezja Dolna nieuchronnie spowodowało transformację tych obszarów. Jej zaludnienie, początkowo słabe, uległo radykalnemu zwiększeniu, pojawiły się liczne wsie, nie brakowało ośrodków życia miejskiego, które w dobie panowania Sewerów zyskały na znaczeniu gospodarczym. Powstały wille zajmujące się produkcją rolną i rzemieślniczą. Nie ma jednak wątpliwości, że każdy aspekt życia gospodarczego Mezji Dolnej powiązany był z wojskiem. Prowincja gospodarczo ewaluowała, żeby zaspokoić potrzeby aprowizacyjne armii, co w efekcie doprowadziło do wykształcenia się rynku cywilnego.

List of abbreviations

AB – *Archaeologia Bulgarica*, Sofia

AncSoc – *Ancient Society* Leuven

ANRW – *Aufstieg und Niedergang der römischen Welt*, Berlin-New York

Archeologia – *Rocznik Państwowego Muzeum Archeologicznego w Warszawie i Polskiego Towarzystwa Archeologicznego we Wrocławiu*

Archeologiya – *Archeologiya. Académie des Sciences, Institut et Musées archéologiques*, Sofia

Balcanica Posnaniensia – *Balcanica Posnaniensia. Acta et studia*, Poznań

Britannia – *Britannia. A journal of Romano-British and kindred studies*, London

Cercetări Arheologice – *Cercetări Arheologice. Muzeul national – București*

Chiron – *Chiron. Mitteilungen der Kommission für Alte Geschichte und Epigraphik des Deutschen Archäologischen Instituts*, München

Dacia – *Revue d'Archéologie et d'Histoire ancienne*, București

EOS – *Eos. Commentarii Societatis Philologiae Polonorum*, Bratislava-Varsovia

Germania – *Germania. Anzeiger der römisch-germanischen Kommission des deutschen archäologischen Instituts*, Berlin

- GSUFF – Godishnik na Sofiyskiya Universitet “Kliment Ohridski” Istoricheski Fakultet 197
- Historia Antiqua – Historia Antiqua, 10, Journal of the International Research Centre for Archaeology, Pula
- Historia – Historia. Zeitschrift für Alte Geschichte, Stuttgart
- IAI – Izvestiya na Arheologicheskaya Institut
- JRS – The Journal of Roman Studies
- JRGZM – Jahrbuch der Römisch-Germanischen Zentralmuseums Mainz
- KHKM – Kwartalnik Historii Kultury Materialnej, Warszawa
- Latomus – Latomus. Revue d'études latines, Bruselas
- Novensia – Novensia. Badania ekspedycji archeologicznej Uniwersytetu Warszawskiego w Novae, later: Novensia. Ośrodek Badań Archeologicznych w Novae Uniwersytetu Warszawskiego
- PBSR – Papers of the British School at Rome
- Peuce – Peuce, Studii si cercetari de istorie si arheologie, București
- RCRF – Rei Cretariae Romanae Favtorum
- SFMA – Studien zu Fundmünzen der Antike, Berlin
- ZPE – Zeitschrift für Papyrologie und Epigraphik, Köln

Inscriptions, diplomas, papyri

- AE – L'Année Épigraphique. Revue des publications épigraphiques relatives à l'Antiquité romaine, Paris
- CIL – Corpus Inscriptionum Latinarum, Berolini-Paris 1863-2006
- ILatNovae – Inscriptions latines de Novae, eds.: V. Božilova, J. Kolendo, L. Mroze-wicz
- ISM – Inscriptiile din Scythia Minor grecești și latine = Inscriptiones Scythiae Minoris graecae et latinae, I-III, V, București, 1980-1999.
- ChLA – Chartae Latinae Antiquiores
- RMR – Fink R. O., Roman military records on papyrus, London 1971
- RMD – Roman Military Diplomas I-V, eds.: M. Roxan, P. Holder

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